Evidence of active inverse faulting in the north-eastern sector of the Calabrian arc (Italy)

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The Calabrian arc represents an accretionary wedge located between the southern Apennines and the Maghrebian chain from which it is separated by two regional shear zones, i.e. the “Pollino Line” and “Taormina Line”, respectively. Since the Pliocene, extension affected the Calabrian chain, determining the formation of normal faults systems. Paleoseismological investigations allowed to associate some of the strongest historical earthquakes occurred in the Calabrian region (Mw up to 7.5) to some of these normal faults.

We analyse the north-eastern sector of the arc which is characterised by a complex structural setting, being affected by the Pollino Line. Indeed, an ~E-W trending fault system (Rossano Fault) cut the area. This fault system displays a complex kinematic history, with the superimposition, during the Quaternary, of a normal kinematics over an older strike-slip one. About two km SE of the Mirto village, an excavation exposed marine deposits, attributed by means of paleontological analyses to an age not older than the Lower Pleistocene, overlain by alluvial-colluvial sediments. These deposits have been deformed by a compressive, NW-SE trending fault, verging landwards. The continental sediments affected by the fault have been radiocarbon dated between 10.018±43 BP and 8397±47 BP.

This fault may represent the surficial expression of 1) a splay of a back-thrust, related to a main active thrust verging towards NE or 2) an active NW-SE transpressive fault or 3) a local compressive deformation (i.e. a restraining bend) related to an active strike-slip fault.

Works are still in progress in order to define the relationship of this compressive fault with the near Rossano fault, to which Galli et al (2006d) attributes a Late Holocene normal activity, considering that this sector has been struck in 1836 by a strong earthquake (Mw=6.2), the causative fault of which has been only tentatively related to the aforementioned Rossano fault.

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